The San Joaquin Valley Aerosol Health Effects Research Center: Particulate Matter Sources, Characteristics, and Effects on Lung Development in Young Animals

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Take a deep breath. Now entering your lungs, bloodstream, and perhaps your brain is "air" bearing all the exhalations of modern life: tailpipe exhaust, fireplace smoke, flame-broiled animal fats, industrial chemicals, and carpet fumes. If you are within 100 yards of a freeway, you also have inhaled tire shreds and partially burned diesel fuel. If downwind from a farm, then ammonia from animal wastes or soot from burning rice straw is inhaled. At the coast, you'll breathe in salt, of course, maybe trans-Pacific sand from eroding Chinese deserts, and perhaps something unexpected: sulfuric acid from the smokestacks of unregulated cargo and cruise ships.

Every fifth-grader knows that we breathe carbon dioxide and oxygen. But no one knows exactly what else we breathe, how much, where it comes from, how it affects our health, or what human subpopulations are susceptible to air pollutants. Answering those questions now is particularly urgent. Some University of California (UC) Davis researchers have found disturbing patterns that link air pollution with serious human health problems in susceptible populations, including chronic asthma in children and early death in some adults.

Therefore, building on its tradition of expertise in many aspects of air pollution (the contributions of agricultural activities, the origins of haze over national parks, the benefits of cleaner fuels and emission controls in automobiles), UC Davis is stepping up to a new level of achievement. With 60 faculty and staff researchers focused on the issues and a record $50 million in targeted funding, the campus has become a leader among the handful of institutions in the United States working intensively on the health effects of particles in our air.

This poster will summarize research being performed by UC Davis, under EPA funding, on the health effects of airborne particles including its influences on the lungs, heart, and other organs and its effect on one particularly important susceptible population—our children. Much of the work takes place in the San Joaquin Valley of California, one of the most polluted air basins in the country and one where the childhood asthma rate has reached record highs.

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